CLAIMS:

1. A battery comprising:

a bipolar electrode stack comprising a collector, a cathode electrically connected to a first side of the collector, an anode electrically connected to a second side of the collector, and one or more electrolyte layers overlaying the cathode and anode, wherein the collector comprises a high-polymer material.

2. The battery of claim 1, wherein the collector further comprises a plurality of electrically conductive particles.

3. The battery of claim 2, wherein the electrically conductive particles are metal particles or carbon particles.

4. The battery of claim 1, wherein the high-polymer comprises one or more of polyethylene, polypropylene, polyethylene terephthalate, polyethernitrile, polyimide, polyamide, polytetrafluoroethylene, styrene-butadiene rubber, polyacrylonitrile, poly(methyl)acrylate, poly(methyl)methacrylate, poly(vinyl)chloride, and polyvinylidene fluoride.

5. The battery of claim 1, wherein the high-polymer comprises an electrically conductive polymer.

6. The battery of claim 5, wherein the electrically conductive polymer comprises one or more of polyaniline, polypyrrole, polythiophene, polyacetylene, polyparaphenylene, poly(phenylene)vinylene, polyacrylonitrile, and polyoxadiazole.

7. The battery of claim 1, wherein the high-polymer material exhibits a weight average molecular weight of from about 50,000 Daltons to about 1 million Daltons.

8. The battery of claim 1, further comprising an electrode extracting plate electrically connected to a side of the collector.

9. The battery of claim 8, wherein the electrode extracting plate comprises a metal foil.

10. A battery module comprising:

a plurality of electrically connected bipolar electrode stacks;

wherein each of the bipolar electrode stacks comprises a collector, a cathode electrically connected to a first side of the collector, an anode electrically connected to a second side of the collector, and one or more electrolyte layers overlaying the cathode and anode; and

wherein the collector of each of the bipolar electrode stacks comprises a high-polymer material.

11. A battery module according to claim 10, wherein the battery module is mounted on or within a vehicle.

12. A method for manufacturing a bipolar electrode assembly comprising:

applying a high-polymer material to a collector surface using an inkjet printing method to form a collector;

applying a cathode material layer to a first side of the collector;

applying an anode material layer to a second side of the collector;

applying a first electrolyte layer overlaying the cathode material layer; and

applying a second electrolyte layer overlaying the anode material layer.

13. The method of claim 12, wherein applying the cathode layer is carried out using an inkjet printing method.

14. The method of claim 12, wherein applying the anode layer is carried out using an inkjet printing method.

15. The method of claim 12, wherein the inkjet printing method is a piezoelectric inkjet printing method.

16. The method of claim 12, further comprising curing the high polymer material.

17. The method of claim 16, wherein curing is carried out using thermal curing or radiation curing.

18. The method of claim 12, further comprising laminating together the first electrolyte layer, the cathode layer, the collector, the anode layer, and the second electrolyte layer to form a bipolar electrode cell.

19. The method of claim 18, further comprising:
forming a plurality of bipolar electrode cells in a stack; and
electrically connecting each of the bipolar electrode cells to form a battery.

20. The method of claim 19, further comprising:
forming a plurality of batteries; and
electrically connecting the plurality of batteries to form a battery module.